

## **Remarks**

### **I. Status of claims**

Claims 1-20 are pending.

Claims 1, 11, and 16-20 have been amended.

### **II. Claim 11**

As assumed by the Examiner, claim 11 was not amended by the prior Amendment filed December 11, 2003.

### **III. Objections to the claims**

The Examiner has objected to claims 11, 14, 18, and 19 under 35 U.S.C. § 112, fourth paragraph, and under 37 CFR 1.75(c).

#### **A. Claim 11**

Regarding claim 11, the Examiner has asserted that:

The technique of “on-the-fly” is used four times in the specification but is not defined in the specification. Similarly, “on-the-fly” is not defined in Merriam-Webster’s Collegiate Dictionary, Tenth Edition. Under the conditions of para 3 above, there is precedent determination and consequently “on-the-fly” provides no limitation of claim 11 to claim 10.

Putting aside the fact that the term “on-the-fly” is a well-known term in the field of computer technology meaning occurring or developing dynamically rather than in a statically predetermined way, claim 11 has been amended and now recites that the scrutiny classifier is generated from a set of training records corresponding to the selected subset of classes after the subset of classes has been selected.

The Examiner’s objection to claim 11 now should be withdrawn.

B. Claim 14

Claim 14 depends from claim 13 and recites the step “further comprising selecting an inclusive class set encompassing the selected subset of classes from which to generate the scrutiny classifier.”

Regarding claim 14 the Examiner has asserted that:

An inclusive class set encompassing the selected subset of classes from which to generate the scrutiny classifier covers all classes including the class that has all classes. Since the inclusive class set is specifically claimed in claim 13 and thereby selected, claim 14 provides no further limitation.

The Examiner's characterization of claim 13 is incorrect: claim 13 does not specifically claim “the inclusive class set.” For the Examiner's convenience, the text of claim 13 is recited below:

Claim 13 (original): The method of claim 12, wherein the scrutiny classifier is generated based upon an occurrence probability estimate for the inclusive class set.

In any event, none of the antecedent claims from which claim 14 depends recites the step of *selecting an inclusive class set*. Therefore, contrary to the Examiner's assertion, claim 14 further limits the subject of the antecedent claims from which it depends because claim 14 does not cover methods within the scope of the antecedent claims in which the step of *selecting an inclusive class set* is not performed. For at least this reason, the Examiner's objection to claim 14 should be withdrawn.

C. Claim 18

Claim 18 depends from claim 16 and recites that the system further comprises an inducer configured to generate a scrutiny classifier. Regarding claim 18, the Examiner has asserted that:

From the specification at page 1, lines 18, 19, “A classifier typically is constructed by an inducer, which is an algorithm that builds the classifier from a training set.” Since the inducer is a classifier and an algorithm, the inducer is indistinguishable from the classifier. Hence, claim 18 provides no limitations to that of claim 16.

The Examiner's assertions that an "inducer is a classifier" and an "inducer is indistinguishable from the classifier" generated by the inducer are factually incorrect. For example, the function of an inducer is to build a classifier from a training set, whereas the function of a classifier is to classify a new instance into one or more classes. Thus, an inducer clearly is distinguishable from a classifier at least on the basis of their respective functionalities.

As explained in the prior Amendment filed December 11, 2003, claim 18 further limits claim 16 because it does not cover systems within the scope of claim 16 that do not include an inducer as recited in claim 18. For at least this reason, the Examiner's objection to claim 18 should be withdrawn.

D. Claim 19

The term "on-the-fly" has been deleted from claim 19, which now recites that the inducer is configured to generate the scrutiny classifier from a set of training records corresponding to the selected subset of classes after the subset of classes has been selected. The Examiner's objection to claim 19 now should be withdrawn for the same reasons explained above in connection with claim 11.

IV. Claim rejections under 35 U.S.C. § 112

A. Record filter 36

The Examiner has rejected claims 1-20 under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement.

1. The Examiner has Failed to Establish a Prima Facie Case of Nonenablement

As stated by the Federal Circuit (emphasis added):

When rejecting a claim under the enablement requirement of Section 112, the [Patent Office] bears an initial burden of setting forth a reasonable explanation as to why it believes that the scope of protection provided by the claim is not adequately

enabled by the description of the invention provided in the specification of the application; this includes, of course, providing sufficient reasons for doubting any assertions in the specification as to the scope of enablement.<sup>1</sup>

The Examiner has asserted that (emphasis added):

... the Examiner asserts that the distribution of the members of second training set is important to the functioning of the scrutiny classifier 20. The record filter 36 will establish such distribution. Without disclosure as to how such distribution is to be established, undue experimentation will be necessary on the part of one of ordinary skill in the art in the implementation of the invention.

There is absolutely no basis for the Examiner's assertion that the "*distribution* of the members of the second training set is important to the functioning of the scrutiny classifier 20." The specification clearly explains the function of the record filter 36 as follows:

Scrutiny classifier 20 is generated by second inducer 22 from a second set of training records corresponding to the subset of classes selected by ballpark classifier 14 (step 34). The second training records subset may be identified by applying a record filter 36 to the entire training records set 18.

That is, the record filter simply has to select training records from the entire training records set 18 with class labels matching the classes selected by the ballpark classifier 14. The specification does not even hint that the *distribution* of the members of the second training set is relevant.

The Examiner has simply invented functionality of the record filter 36 that is not required to implement the embodiment shown in FIG. 1 and then asserted that the specification is insufficient under 35 U.S.C. § 112, first paragraph, because it does not describe a way to implement the unnecessary functionality invented by the Examiner. Accordingly, the Examiner's explanation for why he believes that the scope of protection provided by the claims is not adequately enabled by the description of the invention provided in the specification of the application *is not reasonable*.

In response to Applicant's explanation that none of the claims 1-20 specifically recites a record filter and that record filter 36 is described in the context of only one embodiment of the invention, the Examiner has asserted that:

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<sup>1</sup> *In re Wright*, 999 F.2d 1557, 27 USPQ 2d 1510, 1513 (Fed. Cir. 1993).

If the record filter 36 was so inconsequential to the implementation of the invention, why was it discussed in the detailed description of the invention? Why is the record filter the center of Fig. 1? The Examiner asserts that the sophistication of the record filter establishes the effectiveness of the Scrutiny Classifier and without knowing through the disclosure "how to", the value of this invention is severely limited. Patents are only assigned with the invention is novel and nonobvious. A simple record filter will accordingly establish an obvious scrutiny classifier not worthy of a patent.

The following paragraphs respond to the Examiner's questions and assertions:

1. The reason the record filter is described in the detailed description of the application is because it is a component of one embodiment of the invention recited in claims 1-20. The fact that the record filter 36 is described in the detailed description of the application, however, does not constitute an admission that the record filter 36 is to be read into the claims. Indeed, MPEP § 2111 explains that "Limitations appearing in the specification but not recited in the claim are not read into the claim."
2. The location where the record filter 36 appears in the block diagram of the classification system embodiment 10 is irrelevant to the issue of whether the scope of protection provided by the claims is not adequately enabled by the description of the invention provided in the specification of the application.
3. Whether or not the "value" of the invention is "severely" limited is irrelevant to the issue of whether the scope of protection provided by the claims is not adequately enabled by the description of the invention provided in the specification of the application.
4. Novelty and nonobviousness are issues that are separate and distinct from the issue of enablement under 35 U.S.C. § 112, first paragraph.

For the reasons explained above in numbered paragraphs 1-4, the Examiner's questions and comments quoted above do not constitute a *reasonable explanation* for why he believes that the scope of protection provided by the claims is not adequately enabled by the description of the invention provided in the specification of the application.

Thus, for the reasons explained above, the Examiner has failed to establish a proper *prima facie* case of nonenablement and, therefore, the Examiner's rejection of claims 1-20 under 35 U.S.C. § 112, first paragraph, should be withdrawn.

2. In any event, claims 1-20 are enabled

The Examiner has asserted that:

The specification is silent on the workings of the record filter. The nature and character of the filter are fundamental to the workings of the invention and without such disclosure, one of ordinary skill would have to exercise undue experimentation to achieve successful workings of this invention.

Contrary to the Examiner's assertion, the application teaches the function and operation of the record filter 36 in a way that anyone of ordinary skill in the art at the time the application was filed could have made and used the embodiment of the invention shown in FIG. 1 without undue experimentation. The relevant teaching provided in the application is as follows:

1. "Training records set 18 may be a set of conventional training records. For example, in one embodiment, the training records set 18 corresponds to a database table containing a list of attributes, one of which is designated as a class label attribute." (Page 6, lines 11-14)
2. "The ballpark classifier 14 is generated by first inducer 16 from the set 18 of training records corresponding to the entire set of potential classes into which new instance 12 may be classified" (page 6, lines 15-17).
3. "ballpark classifier 14 is applied to new instance 12 to select a subset 26 of two or more of the potential classes to which new instance 12 is determined to likely belong" (page 6, lines 18-20).
4. The record filter 36 is applied to the entire training records set 18 to identify a second training records subset 24 corresponding to the subset 26 of classes selected by ballpark classifier 14. (See, e.g., page 6, lines 27-31)
5. FIG. 1 shows an embodiment of the invention in which the record filter 36 receives inputs from the training records set 18 and the subset 26 of likely classes selected by the ballpark classifier 14 and outputs the second training records subset 24.

To summarize, the application teaches that the record filter 36 is a "filter" that has a first input for receiving records from set 18, each record containing a list of attributes one of

which is designated as a class label attribute, and has a second input for receiving a list of classes from a set 26. The application additionally teaches that the record filter 36 is operable to identify a second training records subset "corresponding to the subset of classes selected by ballpark classifier 14" based on the training records 18 received through the first input and the set of classes received through the second input. These teachings are incontrovertible.

Thus, with regard to the record filter 36, the Examiner's rejection under 35 U.S.C. § 112, first paragraph, amounts to an assertion that one of ordinary skill in the art at the time the application was filed could not implement a record filter that can be applied to a first set of labeled records to generate a second set of labeled records corresponding to a previously selected set of classes. As explained in the prior Amendment dated December 11, 2003, anyone of ordinary skill in the art at the time the application was filed could have implemented such a record filter, which simply has to select training records from the entire training records set 18 with class labels matching the classes selected by the ballpark classifier 14. Indeed, all that is required is a filter that (1) compares the class label attribute of each of the records in the first records set to each of the classes in the selected class set, and (2) builds the second records set from the records in the first records set that have class labels matching respective classes in the selected class set. Paragraphs 1-11 of the Declaration Under 35 U.S.C. § 1.132 support the conclusion that one of ordinary skill in the art at the time the application was filed could have made and used a record filter with the functionality of the record filter 36 and, therefore, one of ordinary skill in the art at the time of the invention could have made and used the embodiment of the invention shown in FIG. 1 without undue experimentation.

For at least the reasons explained above, the Examiner's rejection of claims 1-20 under 35 U.S.C. § 112, first paragraph, based on his assertion of nonenablement of the record filter 36 should be withdrawn.

B. Misclassification cost

The Examiner also has rejected claim 7 under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement based on the following assertion:

... Further to claim 7 regarding "misclassification cost," the specification at page 7, lines 14 and 15 cite: "An appropriate cost function may be incorporated into inducers in a

conventional way.” Again, without such disclosure one of ordinary skill would have to exercise undo experimentation to achieve the successful workings of this invention.

1. The Examiner has Failed to Establish a Prima Facie Case of Nonenablement

The Examiner merely asserts that “without such disclosure [regarding misclassification cost], one of ordinary skill would have to exercise undo experimentation to achieve the successful workings of this invention.” Since a mere assertion of nonenablement without accompanying reasons does not constitute an explanation, the Examiner has failed to provide any *explanation* for why he believes that the scope of protection provided by claim 7 is not adequately enabled by the description of the invention provided in the specification of the application. Therefore, the Examiner has failed to establish a proper *prima facie* case of nonenablement and, therefore, the Examiner’s rejection of claim 7 under 35 U.S.C. § 112, first paragraph, should be withdrawn for this reason alone.

In response to the explanation provided in the prior Amendment filed December 11, 2003, the Examiner has asserted that (emphasis added):

The Applicant’s quotes both from the Examiner’s First Office Action and from the specification provide ample evidence that the specification as written does not provide sufficient “how to” to enable one of ordinary skill in the art to implement this disclosure such that the result achieves a performance level merited from an invention that is novel and nonobvious. Specification statements such as “An appropriate cost function may be incorporated into inducers in a conventional way” simply adds nothing in advancing the state of the art.

Along a similar line of inquiry, the Examiner has asked:

If everything regarding misclassification cost is so simple and “obvious”, what is the basis under which one can justify the patentability of claim 7?

As explained above, novelty and nonobviousness are issues that are separate and distinct from the issue of enablement under 35 U.S.C. § 112, first paragraph. Accordingly, the Examiner’s question and unsubstantiated assertions quoted in the preceding paragraphs do not constitute a *reasonable explanation* for why he believes that the scope of protection provided by the claims is not adequately enabled by the description of the invention provided in the specification of the application. The Examiner should know that the patentability of



claim 7 does not rest only on the recitation of "misclassification cost," but rather its patentability rests on all of the features recited in claim 7, including all of the featured incorporated from claim 1.

For the reasons explained above, the Examiner has failed to establish a proper *prima facie* case on nonenablement and, therefore, the Examiner's rejection of claim 7 under 35 U.S.C. § 112, first paragraph, should be withdrawn.

2. In any event, claim 7 is enabled

The general rule is that the subject matter required to enable the invention need only be found in the application and/or the prior art for the application to be enabling under Section 112, first paragraph.

As explained above, the specification teaches that (page 7, lines 3-15):

In one embodiment, the size of the ballpark class set 26 may be tailored to accommodate explicit statements about the cost of misclassification, a cost that may vary widely depending upon the nature of the classification application. For example, for an application such as pre-cancer detection, the cost of a misclassification may be extremely high. That is, erroneously labeling a healthy tissue as pre-cancerous may be corrected when further tests are performed, whereas labeling a pre-cancerous tissue as healthy may lead to disastrous consequences. Accordingly, for such applications, the size of the ballpark class set 26 may be increased based upon the magnitude of the misclassification cost until a desired classification sensitivity is achieved. For other applications, such as text classification, the misclassification cost may be relatively low, in which case the size of the ballpark class set 26 may be relatively small. An appropriate cost function may be incorporated into first inducer 16 in a conventional way.

To incorporate misclassification cost into the selection of the subset of classes to which an instance is determined most likely to belong, as recited in claim 7, one skilled in the art at the time the application was filed would have to merely assign a cost to each type of misclassification error in a way that tunes the parameters of the inducer used to generate the ballpark classifier. Anyone skilled in the art at the time of the invention readily could have incorporated misclassification cost into the ballpark classifier based on the disclosure in the present application. Indeed, paragraphs 13-19 of the Declaration Under 35 U.S.C. § 1.132

supports the conclusion that one of ordinary skill in the art at the time the application was filed readily could have designed a ballpark classifier configured to select subset of classes based at least in part upon a prescribed misclassification cost, as recited in claim 7, based on the disclosure provided in the specification of the application. Accordingly, one of ordinary skill in the art at the time of the invention could have made and used the invention recited in claim 7 without undue experimentation based on the teachings of the present application.

For at least the reasons explained above, the Examiner's rejection of claim 7 under 35 U.S.C. § 112, first paragraph, should be withdrawn.

V. Claim rejections under 35 U.S.C. § 101

The Examiner has rejected claims 16-19 under 35 U.S.C. § 101. In particular, the Examiner has indicated that (emphasis added):

The practical application test requires that a useful, concrete and tangible result be accomplished. Claims [16]-19 represent abstract methodology capable of being performed by hand and therefore not in the technological art. The consequence is non-statutory.

The preamble of independent claim 16 has been amended so that the subject matter of the claim is directed to a data processing machine for classifying an instance into one or more classes selected from a set of potential classes. Independent claim 16 therefore is limited to a practical application within the technological arts because the claimed invention as a whole produces a practical application by producing a concrete, tangible, and useful result. For this reason, independent claim 16 is directed to statutory subject matter under 35 U.S.C. § 101.

Claims 17-19 depend from independent claim 16 and therefore also are drawn to statutory subject matter.

For the reasons explained above, the Examiner's rejection of claims 16-19 under 35 U.S.C. § 101 now should be withdrawn.

VI. Claim rejections

The Examiner has rejected independent claims 1, 16, and 20 under 35 U.S.C. § 102(b) over Fujisaki (U.S. 5,835,633).

Each of claims 1, 16, and 20 has been amended and now recites that a subset of two or more of the potential classes from a set of potential classes is *selected*, and a scrutiny classifier that is generated from a set of training records each including a respective class label matching a corresponding class in the *selected* subset of the potential classes is applied to an instance to identify at least one class to which the instance most likely belongs. That is, the particular scrutiny classifier that is applied to the instance “to identify at least one class to which the instance most likely belongs” is generated from training records corresponding to a selected “subset of two or more of the potential classes to which the instance is determined to most likely belong.”

In Fujisaki's optical character recognition system, on the other hand, each of the pre-classifier and specialized networks is generated from respective sets of training records corresponding to respective non-overlapping sets of classes that are *determined before the networks are applied to any instance that is to be classified*. In particular, the pre-classifier network is generated from the predetermined set of classes: upper-case alphabetic characters, lower-case alphabetic characters, numerical digits, and special symbols; and each of the specialized networks is generated from a respective set of feature vectors respectively labeled with the individual names of the characters in the character group corresponding to the specialized network. None of the specialized networks is generated from training records corresponding to a selected “subset of two or more of the potential classes to which *the instance* is determined to most likely belong” (emphasis added). For example, assume that Fujisaki's pre-classifier network determines that an instance most likely belonged to the classes “upper-case alphabetic characters” and “lower-case alphabetic characters,” none of Fujisaki's specialized networks is generated from training records corresponding to both of these classes.

Thus, Fujisaki does not teach or suggest anything about *selecting the classes* from which a scrutiny classifier is generated based on the likelihood of an instance belonging to those classes, as recited in each of independent claims 1, 16, and 20. In addition, Fujisaki's specialized networks are trained based on respective sets of feature vectors with class labels that do NOT match the classes to which the pre-classifier network assigns probabilities. Accordingly, none of Fujisaki's specialized networks is generated from “a set of training records, each including a respective class label matching a corresponding class in the ...

subset classes" selected by the pre-classifier network, as recited in each of independent claims 1, 16, and 20.

For at least this reason, the Examiner's rejection of independent claims 1, 16, and 20 under 35 U.S.C. § 102(b) over Fujisaki should be withdrawn.

Claims 2-15 depend from independent claim 1 and claims 17-19 depend from independent claim 16. Therefore, claims 2-15 and 17-19 are patentable over Fujisaki for at least the same reasons explained above.

It is noted that claims 2-15 and 17-19 have not been rejected on the basis of any prior art. Therefore, these claims also are allowable for this additional reason.

Claims 11 and 19 recite that the scrutiny classifier is generated from the set of training records corresponding to the selected subset of classes after the subset of classes has been selected. Fujisaki does not even hint that any of his specialized networks is generated after the pre-classifier network assigns probabilities to the predetermined set of character groups. For this additional reason, the Examiner's rejection of claims 11 and 19 under 35 U.S.C. § 102(b) over Fujisaki should be withdrawn.

Claim 15 depends from claim 1 and additionally recites the step of applying to the instance a classifier generated from a set of training records corresponding to two or more classes identified by the scrutiny classifier to identify at least one class to which the instance is determined to most likely belong. Fujisaki does not even hint at providing a third classification stage to his two-stage optical character recognition system. For this additional reason, the Examiner's rejection of claim 15 under 35 U.S.C. § 102(b) over Fujisaki should be withdrawn.

## VII. Conclusion

For the reasons explained above, all of the pending claims are now in condition for allowance and should be allowed.

Charge any excess fees or apply any credits to Deposit Account No. 08-2025.

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Serial No. : 09/844,202  
Filed : April 26, 2001  
Page : 18 of 18

Attorney's Docket No.: 10010075-1  
Reply to Office action dated March 5, 2004

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Date: April 27, 2004



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